if

still. in operation, and which infringe the most simple natural laws, that is to say, a veritable collection of the monstrosities of furnace design.

The Subdivision of a Current of Hot Gas. — Assume that the current of hot flowing gas *Q,* which is giving off heat or cooling, is to be divided between two vertical ascending channels, gi and #2, this division to be effected in the manner shown in Fig. 45. The veins of gas *q*| and *q%* are at temperatures *ti* and fe and gi = <?2 and £i = fe. Assume that during the operation of this system the amount of heat lost from the branch *q*| is a little greater than the amount of heat lost from the branch *q%* and that, accordingly, the temperature *ti* becomes slightly less than fe- When fe> *ti,* the

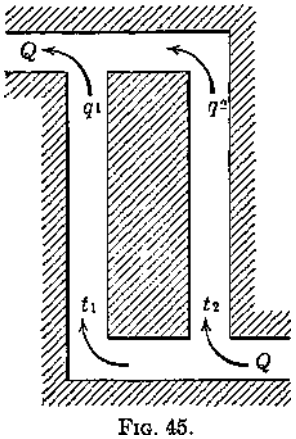

FIG. 45.

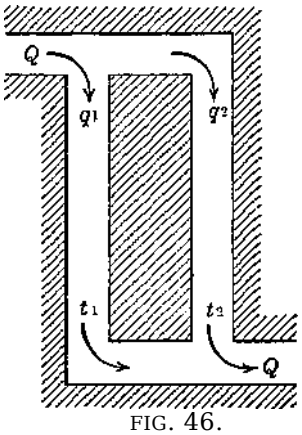

FIG. 46.

weight of the column of gas *q*| becomes greater than that of the column of gas #2, and accordingly the velocity of the current *qi* will become less than that of the current #2- The decrease of the velocity of the current of gas *qi* results in a further lowering of its temperature *t*|; in other words, the velocity of the current of gas *qi* will continue to diminish, and its temperature *t*| will continue to decrease. During this time the velocity of the current of gas #2 will, on the contrary, be increased, and its temperature will become higher. The current of gas *q*| will finally cease to flow and the entire volume of the current of gas *Q* will then pass through the branch *q%.* But there will still be a loss of heat from the channel *qi* and after the velocity of this current has decreased to zero it will reverse and travel in the opposite direction, as is